THE IMPACT OF URBAN/RURAL UPBRINGING ON APPRECIATION OF NATURAL ENVIRONMENTS

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ABSTRACT: For the first time in human history, more than half of the world's population live in towns and cities. The acceleration of habitat alteration as well as modern lifestyles dramatically reduce the interaction with natural environments. To get an overview of this issue, a comparison was made between individuals who lived most of their childhoods in high-rise blocks and who experienced nature on a daily basis from living and playing in suburbia or a rural environment. Can a lack of contact with natural environments lead to an estrangement from nature and consequently less tendency to invest in its protection?

This paper hypothesizes that a sense of estrangement can occur due to the lack of daily contact with nature and can impact on the way people perceive and value natural environments. Our research question is, 'does rural/urban upbringing impact the way individuals' perceive nature?' In order to answer this question, we focus on individuals' perceptions about their workplace window-view. In addition to a questionnaire, Kevin Lynch's and Brian Goody's 'mental images' method was employed to identify the preferred elements of their workplace window-view and whether urban/rural upbringing has any influence on their preferences.

This paper presents some early findings of the research. The innovative method of this paper lets us identify aspects of personal appreciation and personal values related to individuals' lives and lifestyles. In the process of analysis, participants' mental images were compared against photos taken from their workplace views. We conclude that degree of urban upbringing has an effect on how much individuals value visual contact with a natural environment. In other words, childhood environmental experiences influence the way current surroundings is experienced, understood and appreciated.

Keywords: Natural Environments, Urban/Rural Upbringing, Mental Mapping, Cognitive Image, Estrangement from Nature

1. INTRODUCTION

For the first time in human history, more than half of the world's population live in towns and cities (United Nations 2007). This figure is expected to reach 60% by 2030. The acceleration of habitat alteration as well as a modern lifestyle reduces interactions with natural environments. These changes may lead to a sense of estrangement from nature and alter the way natural environments are perceived.

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The contributing factors that increase the likelihood of having a sense of estrangement from nature can be condensed into following groups: 1) "Extinction of Experience" (Pyle, 1993), 2) accelerating pace of life and the lack of sense of security, and 3) increase of population and growing process of urban intensification. These factors are explained in the next paragraphs.

1) Extinction of Experience:

Contact with urban nature often constitutes the majority of first-hand experience with nature for city residents. Robert Michael Pyle (1993) coined the elegant phrase "the Extinction of Experience" to emphasise the importance of the direct contact with raw nature. The core idea is that the lack of direct contact with nature in ones' everyday surroundings reduces their appreciation for the natural environment. Pyle (2003) stated that disaffection and apathy toward natural environments are the predictable consequences of the Extinction of Experience. Jared Diamond (1993) made an interesting observation that supports the Extinction of Experience. Based on his almost thirty-year long experience of living in New Guinea, Jared states that the young who work in urban areas of New Guinea show little interest in the surrounding national parks and zoos and even have a fear of the forest.

2) Accelerating pace of life and the lack of sense of security:

As stated by James R. Miller (2005) the accelerating 'pace of life' contributes to the estrangement of people from nature. 'Overscheduled adults' and their fears over 'undesirable strangers' or road safety for their children push both age groups away from engaging with natural environments even when they are within reach. The problem is compounded by the fact that children are increasingly adopting a sedentary lifestyle and prefer to stay inside watching TV or playing computer games (Miller 2005) rather than going outside. Pergams & Zaradic (2006) link the decline in US national park visits to the increase in the use of video games, home movies and internet. They add further "[t]his suggests that even if our rising love of electronic media is not directly responsible for keeping us away from National Parks, both are a manifestation of an on-going cultural change in values" (p.391).

3) Increase of population and urban intensification:

The rapid increase of population as well as the growing process of intensification heightens this estrangement from nature. In this respect, Fuller & Gaston (2009) have documented a dramatic drop in per capita green space provision in European cities with greater population densities. According to their

analysis, access to green space is likely to decline rapidly as cities grow hence people would become geographically isolated from opportunities to experience nature.

Considering these facts, the separation between nature and city-dwellers is becoming increasingly deeper. The question is 'do people with different environmental upbringing, who had more or less access to greeneries during their childhood, perceive nature differently?'

2. MENTAL IMAGES AS A RESEARCH TOOL

This paper applies the mental imaging tool[1] in order to gain an understanding of individuals' environmental perceptions and the possible impact of urban/rural upbringing on their appreciation of nature. Mental mapping was used by Kevin Lynch (a planner and designer) (1960) when he investigated how people orientate themselves in cities. This method was later used by others (e.g. Gray 1998; Richmond 2002; Gentry 2010).

The subjects of the research were postgraduate students of the University of Auckland who have fixed workplaces at the university with an outdoor view. Cognitive imaging is a process in one's mind, while using mental images as a research tool means that respondents were requested to externally represent this internal process. In our research, the participants were asked to draw a sketch of how they remembered their outdoor views from their workplace windows. The potential significance of a window view was highlighted by R. S. Ulrich in a ground-breaking study. In this seminal work, Ulrich (1984) showed that recovery from surgery could be influenced by the elements that can be seen from the window of a hospital room. In our research we extended the idea to study if there is any relationship between participants' urban/rural upbringing and elements in their window view that they recall in their drawings.

In this section, we discuss what mental images are and how individuals' form them. Then, we provide some insights about how a mental image tool may capture the link between individuals' past urban experiences and their environmental preferences. In section 3, the questionnaire design and the

[1]Mental image (also known as mental mapping) is a multidisciplinary field and as such there is a host of interchangeable terms among the disciplines including cognitive representation (Downs & Stea 1977), mental images (Pocock 1979), mental maps (Gould & White 1986), and environmental images (Lynch 1960) that are regularly used. In this paper we use the term 'mental imaging' in order to avoid probable misleading that the word 'map' can cause for the readers. The word 'image' as has been used by Kevin Lynch (architect and planner) implies the way individuals "restructure in words and sketches the visual images of places that they have directly experience" (Tuan 1975, p.205).

structure of the survey is described. Finally, a preliminary analysis and early findings are presented.

2.1. What Are Mental Images?

Mental images are cognitive abilities that allow individuals to acquire, store, recall, and decode information about the relative locations and attributes of phenomena in their everyday spatial environment(Downs & Stea 1977, p.6).The everyday environment, as Downs & Stea (ibid) explain, refers to "the world that [individuals] interact with regularly and that serves as the normal setting for [their] activities" (p.7). Mental pictures of our everyday environment are widely used in daily life; we use mental images to find our way around the city or toward our own workplace. 'Mental images' empower us to 'relive' our past experiences to understand present and future situations.

The perception or mental images of the environment and acting based on them will be formed by a sequence of cognitive steps. Peter Senge's (1994) "Ladder of Inference" depicts this process Senge (1994, p.243):

Step 1. Receive environmental data through senses

Step 2. Select data from what observed (filter)

Step 3. Add meaning to the data

Step 4. Make assumptions on the basis of the selected data and the meaning added

Step 5. Adopt beliefs about the environmental realities and continue to select data that correspond to these beliefs (back to Step 2)

Step 6. Act upon beliefs

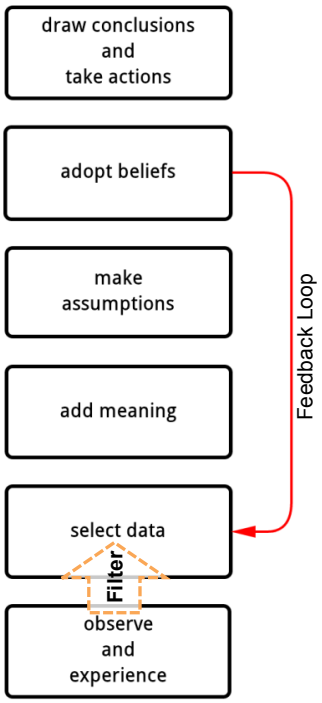

Figure 1: How We Shape Our Mental Images

Three important points can be learned from this process of mental images formation. First, the cognitive filtering that occurs in the initial stage of encountering with the environment (Step 1 of 'Ladder of Interference') implies that mental images are private versions of environmental realities as stated also by Graham (1976) and Sulsters (2005). Second, objects included in mental images; each have a

personal meaning for observers (Step 3). Pocock (1979) expressed this by saying that: "[objects in individuals' mental images] are not recalled for their physical presence per se, but because they are *significant for something*—functionally, socially, symbolically, the particular reason being determined by the instructional set" (p. 284).Third, not only individuals' past experience but also their beliefs (Step 5) can have an impact on how they filter their observations. Lynch (1960) agrees, explaining:

> Environmental images are the result of a two-way process between the observer and his environment. The environment suggests the distinctions and relations, and the observer…selects, organizes and endows with meaning what he sees. The image so developed now limits and emphasizes what is seen, while the image itself is being tested against the filtered perceptual input in a constant interacting process. Thus the image of a given reality may vary significantly between different observers (p.6).

Consequently, it must be concluded that mental images are personal and unique images of the environment. However, although these images contain individuals' values and beliefs; similarities might appear between mental images of individuals with similar lifestyle and experiences. This is the focus of our research. We seek to identify a correlation between urban/rural upbringing and the elements they included in their mental images of their window view.

3. THE SURVEY

3.1. Design Of The Research

For the purpose of this research, we have made the assumption that people with similar (urban/rural) upbringings have had comparatively the same amount of contact with a natural environment. This brings us to the hypothesis that individuals are likely to produce similar mental images because of having similar experiences and likely therefore to apply similar filtering. Hence, objects in their mental images would relatively have the same meanings for them.

Participants were asked to draw a sketch of how they remember their daily environments (i.e. for the purpose of this research, their workplace window view). The participants were limited to postgraduate students of the University of Auckland who are working in fixed workplaces with views to the outdoor. During the personal interview, they were particularly requested to:

1. sketch from memory (i.e. there were not permitted to look at the view from the window) the most significant elements of their office window view
2. number from 1 to 5 the elements of their window-view in the order that they draw them
3. evaluate each element based on a five-point Likert scale marked ‘ ‘A’ as strongly like’, ‘B’ as ‘like’, ‘C’ as ‘not sure’, ‘D’ as ‘dislike’ and ‘E’ as ‘strongly dislike’

At the end, we asked participants to rate their overall feeling about their window view on a five-point Likert scale from ‘strongly like ’to ‘strongly dislike’.

For the analysis, we only focused on the content of the images and not the aesthetics of the sketch. Therefore, there were no rules on how to draw mental images. The only restriction was that the image should not be copied from the outdoor view but drawn from memory. This was clearly explained to the participant during the survey. Participants were also supervised to ensure, they would not look out of their window while drawing. Sketches were compared with photographs of the actual views. Figure 2 shows a participant’s sketch and its related photo. The view was ranked strongly liked by the participant who was brought up in a rural environment.

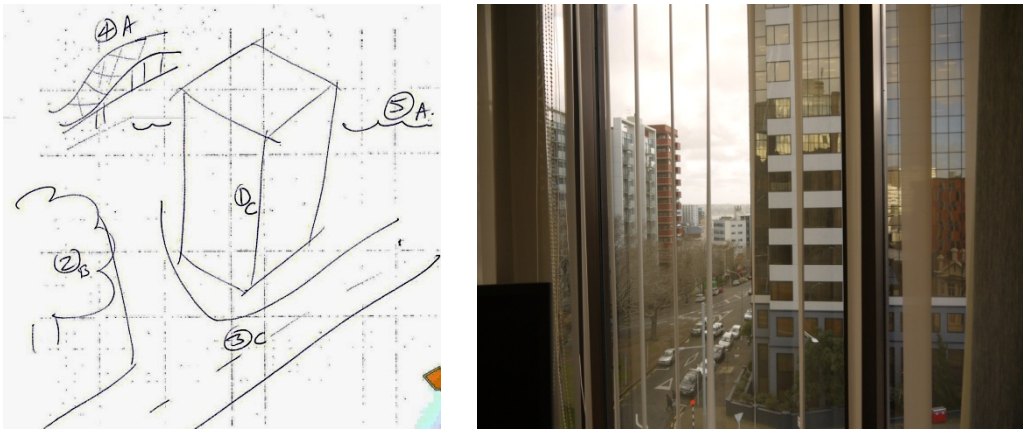

Figure 2. The Perceived Window View as Sketched by a Participant and Its Related Photo on the Right

A series of questions was asked to determine individuals’ degree of urban or rural upbringing. In this respect, participants were requested to name the place (city/town or village) where they lived for most of their childhood. We also asked them to specify the housing type in which they spent most of their childhood. This information was used to classify participants according to one of the following categories, highly urbanized, urbanized, slightly urbanized and rural. The classification was made according to the criteria shown in Table 1 based on

participants' places of residence and housing type where they spent most of their childhood[2].

The postgraduate students used in the survey were recruited by placing an advertisement in the postgraduate student and international student newsletters and by emailing the advertisement to their university email addresses by student administrators of each school. Faculty social networking sites such as Facebook were also used to recruit student respondents. There were just over 120 participants, comprising Post-Doc, PhD, Honours and masters students. Participation in this survey was voluntary and without incentive or reward for questionnaire completion.

Table 1 Degree of Urban or Rural Upbringing

Categories	City or town	+8 floors	5-8 floors	2-4 floors	1-4 floors	1-3 floors
Highly urbanized	Megacity	+	+	+		
Highly urbanized	City	+	+			
Urbanized	City			+	+	+
Slightly urbanized	Suburb			+	+	+
Slightly urbanized	Town			+	+	+
Rural	Town				+	+
Rural	Village			+	+	+

3.2. The Survey Participants

The gender balance of the distribution between male and female was almost exact (51% male and 49% female) and the balance across the degree of urban or rural upbringing was reasonably the same. However, as highlighted in Table 2, only 11% of the participants were classed as highly urbanized.

Table 2 Number of Respondents by Gender and Degree of Urban or Rural Upbringing

Degree of urban or rural upbringing	**Female**		**Male**		**Total**
Highly Urbanized	6	5%	8	7%	11%
Urbanized	22	18%	15	12%	30%
Slightly Urbanized	14	11%	17	14%	25%
Rural	18	15%	22	18%	33%
Total	60	49%	62	51%	100%

[2] In this research participants were advised to consider childhood until the age of 15.

4. SURVEY RESULTS

As shown in Figure 3, the window-view elements that were strongly liked by most of the participants are ‘trees’ followed by ‘park’ and ‘blue sky/clouds’.

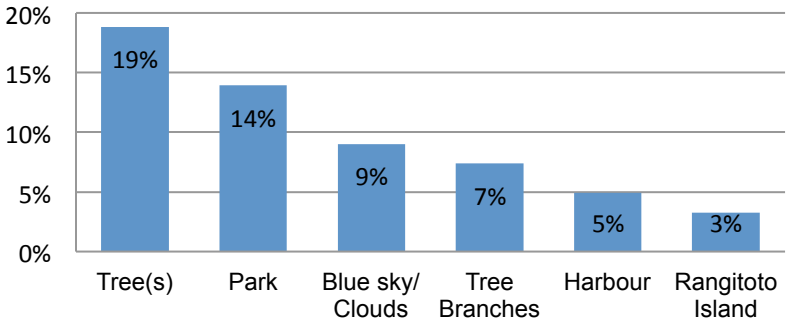

Figure 3. The Strongly-like Elements of the Window View

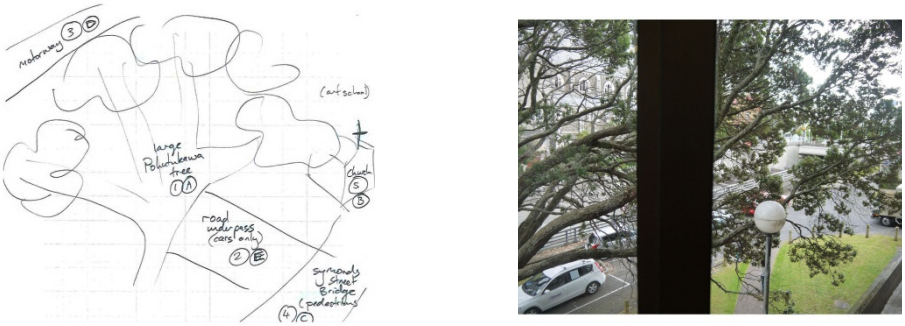

Figure 4. The Participant Strongly Liked the Tree in her Window View

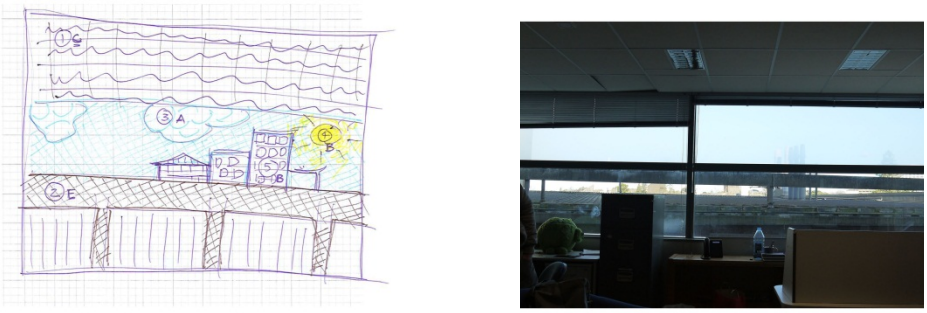

Figure 5. The Participant Strongly Liked Seeing the Movement of the Clouds from his Window

The most strongly disliked elements of the participants' window view, see Figure 6, were any features of a nearby building. This includes whole building blocks, windows of nearby building, blank walls, roofs of nearby buildings or individual details such as chimneys. The second most disliked elements in the window view was roading either a motorway or street.

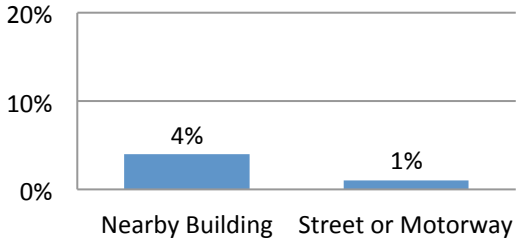

Figure 6. The Strongly-dislike Elements of the Window View

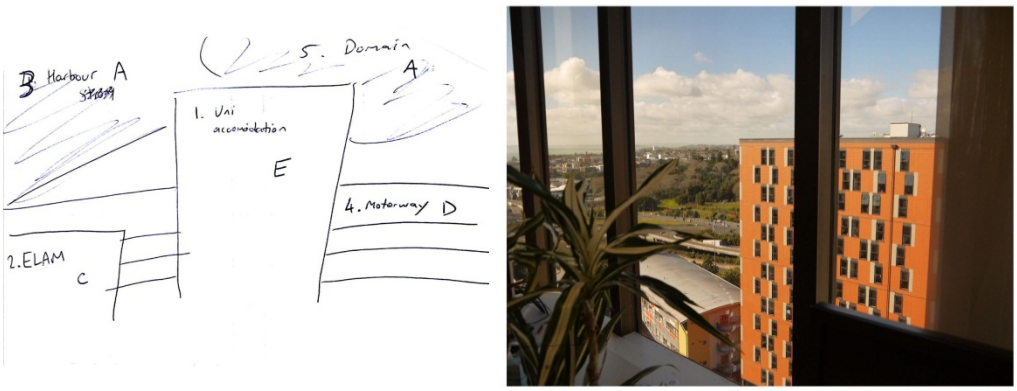

Figure 7. The participant ranked the orange building as "strongly dislike"

4.1. What elements in the view make it 'strongly liked'?

As shown in Table 3, of 117 participants who answered the question about their overall feeling of their office window view, 31 respondents rated it 'strongly liked'.

Strongly like	31
Like	55
Not Sure	17
Dislike	13
Strongly dislike	1
Grand Total	117

Table 3 Overall Feeling About the Office Window View

To understand what makes respondents strongly like their views, we analysed the elements of the window views that have been ranked as 'strongly liked'. As shown in Figure 8, parks were mentioned 9 times; this was followed by islands that could be viewed on the horizon and outlook onto trees. Seeing a blue sky

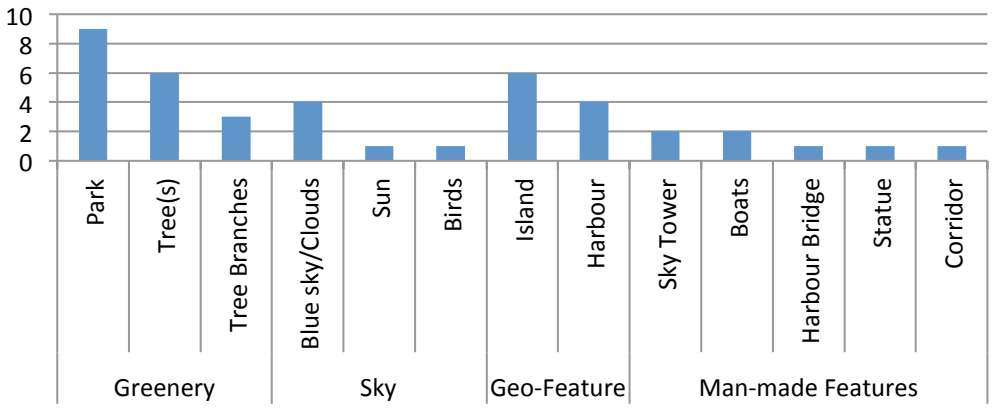

Figure 8. Strongly-like Elements of Strongly-liked Window Views

and the movement of clouds or the harbour in the distance were ranked equally as the third 'strongly liked' elements.

4.2. What Elements in the View Make One to Dislike the View?

Referring to Table 3, 13 respondents disliked their views. As shown in Figure 9,

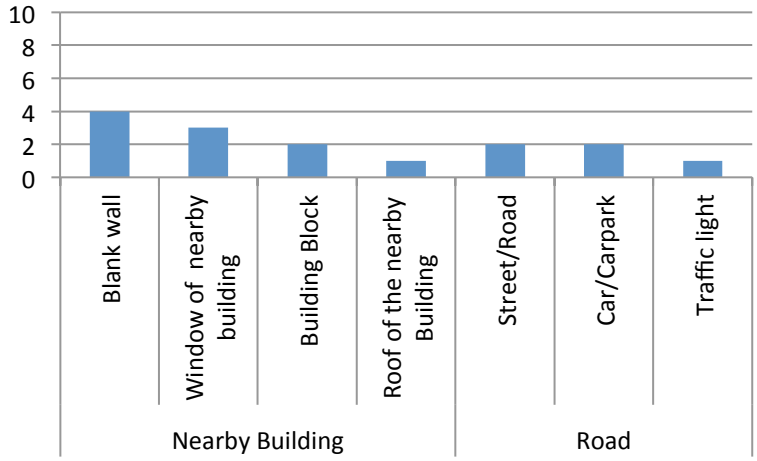

Figure 9. Dislike/Strongly-dislike Elements of Disliked Window Views

a view to any feature of a nearby building was the most common reason to result in participants disliking the view.

4.3. What Elements Did Respondents Omit from Their Drawings?

Some of the respondents didn't draw all the elements that they could see from their windows. These elements were either intentionally ignored[3] or unconsciously omitted from their drawings. The so-called 'elided objects' are detected by comparing the drawings with photos taken from respondents' views.

As discussed in section 2.1, during the process of creating mental images, individuals use a cognitive filtering which we expected to be shared between the individuals with the same past experiences, values and beliefs. Accordingly we investigated if there is any correlation between the omitted elements and respondents' degree of urban or rural upbringing. As shown in Table 4, overall 80% of participants have omitted 'sky' from their drawing; it is followed by elision of 'people' and 'cars'.

Table 4 Omitted Elements

Elements in the view	% of omitted elements	# of omitted elements	# of participants who had a view to the particular element
Sky	80.41%	78	97
People	68.30%	28	41
Cars	65.60%	31	48
Buildings	52.22%	57	109
Trees/Park	26.85%	29	108
Road	19.23%	10	42

To test our hypothesis, we examine the correlation of mental maps who omitted 'buildings' and 'greeneries' (trees and park) from the drawings with their relative urban/rural upbringings.

Trees were mostly included in drawings of those who had less access to the natural features in their childhood. As shown in Figure 10, respondents who had greater access to a natural environment in their childhood, namely rural and slightly urbanized participants have omitted trees and parks more

[3] For instance one of the participants has learnt to ignore the nearby street and its noise over three years' time of studying in the same place. He hence didn't draw the street which was the most dominant element in his view.

from their drawing. On the other hand, participants who lived most of their childhood in urbanized or highly urbanized environment included natural features like trees and parks in their drawings. It seems that the more urbanized individuals are the better they notice and remember natural features viewed from their windows.

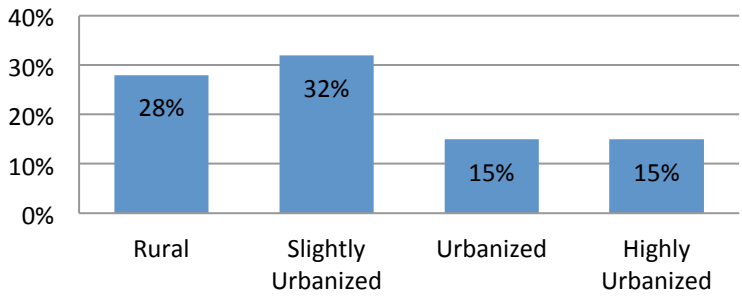

Figure 10. Correlation between Degree of Urban/Rural Upbringing and Omitted Trees and Parks from Drawing

Exploring the ranking of greeneries of the ones, who included them in their drawings; it looks as if greeneries are more valued by rural and slightly urbanized respondents. Table 5 shows this comparison. While no concrete conclusions can be made from this table some possible explanations can be proposed. Rural and slightly urbanized participants might only able to recall the greeneries that had a strong positive impact on them. Meaning that as respondents become more urbanized they became more likely to recall the presence of greeneries in their view independent from how they valued it. Alternatively we can claim that urbanized and highly urbanized respondents although recalled the greeneries more, they didn't value them as much as the others. This supports the concept of estrangement from nature we discussed earlier.

Table 5 Degree of Urban/Rural Upbringing and Omitted Trees or Parks (or both) from Drawing

	Rural	Slightly Urbanized	Urbanized	Highly Urbanized
No. of participants who omitted trees/park from their drawings	10	9	5	2
The Total No. of participants who had trees/park in their views	36	28	33	13
Percentage of the participants who omitted trees/park from their drawings	28%	32%	15%	15%
Percentage of the participants who included trees/park in their drawing and ranked them 'strongly like'	74%	68%	66%	50%

Omitting buildings from their drawing is more likely to happen for highly urbanized individuals. Looking at Figure 11, it is clear that the percentage of omitting buildings from their drawings increase as respondents' become more urbanized. Having more contact with built environments during their childhood make highly urbanized respondents to ignore and omit buildings within their views while constructing their mental images. Being used to seeing buildings from their views, highly urbanized respondents have no strong negative feelings about the presence of buildings in their views. Table 6 shows decrease in

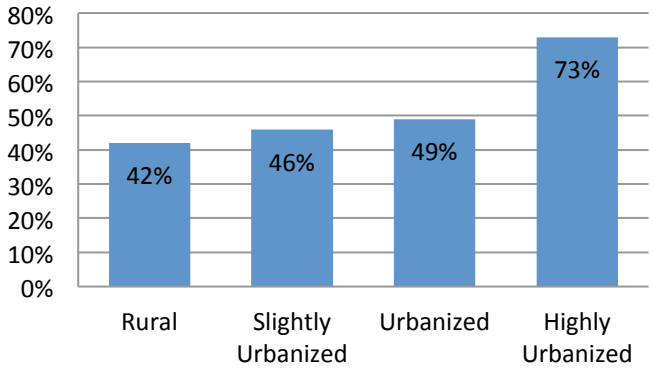

Figure 11. Correlation between Degree of Urban/Rural Upbringing and Omitted Buildings from Drawing

percentage of buildings ranked 'strongly dislike' as level of urbanization increased.

Table 6 Degree of Urban/Rural Upbringing and Omitted Buildings from Drawing

	Rural	Slightly Urbanized	Urbanized	Highly Urbanized
No. of participants who omitted buildings from their drawings	14	12	17	8
No. of participants who had buildings in their views	33	26	35	11
Percentage the participants who omitted buildings from their drawings	42%	46%	49%	73%
Percentage of the participants who included buildings in their drawing and ranked them 'strongly dislike'	19%	16%	14%	0%

5. DISCUSSION AND CONCLUSION

This paper has presented only preliminary results. In future studies, the potentially confounding factors should be taken into account; like individuals' age, sex differences, degree of experience with the environments, socioeconomic status (Krupat 1985; Richmond 2002; Sulsters 2005).

Moreover, the survey conducted at the University of Auckland involved only a limited sample just over 120 postgraduate students. This cannot be expected to represent the general population. For example, the number of highly urbanized participants was very low in this study which shows the necessity for using a larger sample in future investigations.

During the study, we carried out a literature review about the rapid alteration of human habitat in recent years toward providing less access to natural environments. This may impact on individual environmental preferences and the way they value natural environment. Mental images of their workplace window view were collected from 122 postgraduate students of the University of Auckland. We conclude that having a view to a natural environment compared to nearby buildings is preferred by most of the respondents irrespective of their urban/rural upbringing. As individuals' level of urbanized experiences in their childhood increased, it was more likely that they recalled natural environments within their views. Given that the higher percentage of the rural and slightly urbanized respondents, who draw

greeneries, ranked them ‘strongly like’, it seems that greeneries are more valued by these groups of respondents. This result agreed with that of literature. Exploring reaction toward the presence of building in views, no strong negative feelings were detected in highly urbanized respondents. These findings can strongly support the impact of urban/rural upbringing on appreciation of their immediate surroundings.

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